9489.1994(01)

CLARIFICATION ON THE DISTINCTION BETWEEN THERMAL DESORBERS AND INCINERATORS

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

February 23, 1994

Mr. David D. Emery
President
Bioremediation Service, Inc.
P.O. Box 2010
Lake Oswego, Oregon 97035-0012

Dear Mr. Emery:

This is in response to your December 21, 1993, letter requesting clarification on the distinction between thermal desorbers and incinerators. In particular, you questioned whether temperature was a criterion for distinguishing between desorbers and incinerators and whether chlordane contaminated soil can be effectively and safely treated by thermal desorption.

Under the Environmental Protection Agency's (EPA's) regulations, thermal treatment units that are enclosed devices using controlled flame combustion and that are neither boilers nor industrial furnaces are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart O. Definitions of boilers, industrial furnaces, and incinerators are established in 40 CFR 260.10. Thermal treatment units that do not use controlled flame combustion and that are not industrial furnaces are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

The use of "controlled flame combustion" determines whether EPA regulates a device used for thermal desorption as an incinerator or a "miscellaneous unit". Consequently, a thermal desorber would be subject to regulation as an incinerator if it was equipped with a fired afterburner to destroy desorbed organic compounds, or if the desorption chamber was directly fired, irrespective of how the desorbed organics were controlled. On the other hand, if the desorption chamber was indirectly heated and the desorbed organics were not controlled using controlled flame combustion (e.g., no afterburner), the thermal desorber would be subject to regulation as a "miscellaneous unit". Thus, in response

to your questions, temperature is not a criterion that is used to determine the regulatory status of a thermal desorber.

EPA's regulations for miscellaneous units are not prescriptive given the variety of devices that fall into this category. Rather, the regulations require the permitting official to establish permit conditions that are necessary to protect human health and the environment. For "miscellaneous" thermal treatment units, permit writers will generally require compliance with all of the Subpart O incinerator standards that are appropriate for the technology and then determine if additional controls are needed to ensure that emissions are safe.

Please note that I have described EPA's regulatory classification approach for thermal desorbers. Under the Resource Conservation and Recovery Act, EPA authorizes the States to implement the hazardous waste management regulatory program. State regulations may be more stringent or broader in scope than EPA's. Therefore, you should check with the State in which the facility in question is to be located to identify any applicable standards.

With respect to your question as to whether chlordane contaminated soil can be effectively and safely treated by low temperature desorption, you should contact EPA's technical expert on thermal desorption, Paul de Percin, Office of Research and Development, for assistance. Mr. de Percin can also be consulted about TCDD conjugation but, without full thermodynamic and kinetic data regarding the process involved, it may be difficult to give you any definitive assistance. He can be reached at 513-569-7797.

I hope that this information will be helpful. If you have further questions about the regulatory classification of thermal desorbers, please contact Bob Holloway of my staff at 703-308-8461.

Sincerely,
Michael Shapiro
Director
Office of Solid Waste

cc: Paul de Percin; Bob Holloway

9432.1996(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 12, 1996

Mr. Randall A. Jones
Director, Regulatory Affairs
Molten Metal Technology
51 Sawyer Road
Waltham, MA 02154

Dear Mr. Jones:

This is in response to your July 21, 1995 letter to Stephen Bergman of my staff regarding MMT's proposal to use industrial hazardous and non-hazardous wastes as feedstock for your Catalytic Extraction Processing (CEP) unit to produce a synthesis gas. These wastes include but are not limited to RCRA-listed hazardous wastes such as chlorinated organic compounds FO24, KO19 and KO20. In your letter, you seek OSW concurrence on the following points:

> "the CEP unit deployed in such an application is a legitimate recycling unit that is not subject to RCRA permitting requirements,
>
> the secondary materials are 'used or reused' pursuant to 40 CFR §261.2(e)(1)(I), and
>
> the CEP synthesis gas that meets established specifications for material use is a legitimate commercial chemical product with a variety of normal uses, including use as a fuel."

During its analysis, my staff has not attempted to make a determination as to its status as a legitimate recycling unit. Such a determination is made by the appropriate RCRA authorized state or EPA regional office. The CEP process, should it meet the established criteria in the judgement of the appropriate regulatory authority, would be considered a legitimate recycling operation. We are aware that the state of Texas recently reviewed your proposal to use a CEP unit to produce syngas from RCRA-listed hazardous waste at the Hoechst Celanese facility in Bay City,

Texas and found it to be a legitimate recycling process subject to a number of conditions specific to the site. At the state's request, EPA provided input to Texas on the Agency's direction on comparable fuels, as discussed below.

This letter responds only to general regulatory questions regarding the CEP technology. Different regulations and site specific conditions in RCRA authorized states may dictate different outcomes at different sites.

Application of the "Use/Reuse" Provision

As I stated earlier, it is the responsibility of EPA regional offices or RCRA authorized states, using specific criteria related to a particular site, to determine whether or not a particular process is a legitimate recycling operation or whether it is a form of waste treatment. Once this determination is made, the state or EPA region could then determine whether or not the hazardous waste input meets the terms of the 40 CFR 261.2(e)(1)(I) "use/reuse" exemption.

This "use/reuse" provision exempts from the definition of solid waste materials that "can be shown to be recycled by being used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed..." This exemption does not apply if the product is either placed on the ground or burned for energy recovery. Therefore, as long as the products of the process are not burned for energy recovery or used in a manner constituting disposal (see "Status...When Used to Make a Fuel" below) and assuming the process is determined to be legitimate recycling, the materials used by the CEP unit to make the gas would not be regulated as solid waste. In such a case, the syngas would not be regulated as a hazardous waste derived product since the feedstock would no longer be regulated as a solid waste. Should both legitimacy of recycling and "use/reuse" be established, the CEP unit itself would be excluded from RCRA jurisdiction.

As for the status of residuals of the synthesis gas production process, those residuals that are not themselves listed and do not fail one of the hazardous characteristics, as described in 40 CFR Part 261 Subpart C, are not regulated as hazardous waste, providing that the findings mentioned above are made.

However, listed or characteristic residuals would be considered newly generated wastes subject to RCRA.

Status of the CEP When Used to Make a Fuel

The status of the feed materials changes when the output from the CEP is burned as a fuel, since the use/reuse provision does not apply when the hazardous waste feedstock is used to produce a fuel. According to 40 CFR §261.2(e)(2)(ii), "materials burned for energy recovery, used to produce a fuel, or contained in fuels...are solid wastes, even if the recycling involves use, reuse, or return to the original process..."

Comparable Fuels

Our current regulations do not distinguish among hazardous waste-derived fuels based upon how a particular fuel might compare to a fuel that is not derived from hazardous waste. The Office of Solid Waste has spent considerable time looking at this issue. EPA recently proposed an exclusion for "comparable fuels" that resemble fuels made from virgin materials. The Agency also proposed an exclusion for synthesis gas meeting stringent specifications from the definition of solid waste (and therefore, from regulation as hazardous waste). The Agency believes that syngas meeting the stringent requirements of the proposed exclusion are more appropriately classified and managed as products than as wastes. Based on the information you have provided on MMT's proposed CEP unit, the syngas produced by this unit should qualify for this exclusion.

We are persuaded that these changes will have a positive impact on the development of new recycling technologies. Such changes are a high priority in the context of our overall reevaluation of hazardous waste regulations to remove disincentives to environmentally sound recycling technologies that produce products comparable to those manufactured using virgin materials.

Thank you for your interest in hazardous waste recycling and innovative technologies. If you have any further questions regarding the regulation of solid and hazardous wastes, please don't hesitate to contact Stephen Bergman of my staff at (202) 260-5944.

Sincerely,

Michael Shapiro, Director
Office of Solid Waste

be addressed under the SIP process or potentially by a RCRA permit writer using the omnibus permitting authority.

In developing today's proposed rule, a number of people representing a wide range of interests (e.g., industry representatives, environmentalists) have indicated, however, that the rule may be simpler to implement and more protective if the controls were technology-based. They advocate using risk assessment only as a check to determine if the standards are protective on a site-specific basis. They cite the current limitations of risk-based standards in this particular situation, including: (1) indirect exposure (e.g., uptake through the food chain) has not been considered for carcinogens; (2) metals controls are proposed only for those metals for which sufficient health effects data exist to establish acceptable ambient levels; and (3) the metals controls are difficult to implement by limiting feed rates of individual metals given the physical matrices of wastes and the variability of metals concentrations. We agree with these concerns and are initiating a testing program to develop technology-based controls for particulate matter to provide a measure of control for particulates, including metal particulates and adsorbed organic compounds, commensurate with best demonstrated technology (BDT) for hazardous waste incinerators. See RCRA section 3004(a)(1)—section 3004 standards are to be revised periodically to take into account improvements of measurement and technology. If EPA establishes a BDT particulate standard, the risk-based controls for metals emissions would still apply and would then be used as a check to determine if the BDT standard provides adequate protection on a case-by-case basis. Given the limitations of current risk assessment methodologies, we do not believe that it could be demonstrated that a BDT standard substantially over-regulates in many situations.

We are not proposing at this time to lower the existing particulate standard because we have not conducted adequate field testing of hazardous waste incinerators to establish a BDT particulate standard.[12] Further, once the BDT standard is identified, we would then need to consider the impact on the regulated community of applying the standard to establish a reasonable compliance schedule.

II. Definitions of Incinerators and Industrial Furnaces

We discuss below the basis for proposing to revise the definitions of incinerator and industrial furnace, the regulatory status for sludge dryers, and a request for comment on regulating all hazardous waste thermal treatment devices under parts 264 and 265, subpart O.

A. Definition of Incinerator and Industrial Furnace

Existing definitions in § 260.10 for incinerators and industrial furnaces consider how thermal energy is provided to the device. Both definitions stipulate that the device must utilize controlled flame combustion, thus excluding devices using other means to supply the heat necessary to combust or otherwise themally treat waste. Thus, for example, electric arc smelters are not industrial furnaces and devices using infrared heat to destroy waste are not incinerators. Significant regulatory consequences result from these determinations. Electric arc smelters that reclaim nonindigenous metal hydroxide sludges are not industrial furnaces, and, thus, are exempt from regulation under § 261.6(c)(1), while smelters using direct flame combustion to reclaim the same sludge would be regulated under the May 6, 1987, proposed rules for boilers and industrial furnaces. Infrared devices used to destroy waste would be regulated under the subpart X permit standards of part 264 and the subpart P interim status standards of part 265, while controlled flame incinerators would be regulated under subpart O of parts 264 and 265 (and any amendments resulting from today's proposal). The subpart X permit standards under part 264 are not prescriptive; permit writers use engineering judgment and risk analysis to determine appropriate permit conditions.

We believe that incinerators and industrial furnaces pose much the same risk irrespective of whether they use controlled flame combustion or some other means to provide heat energy. Therefore, we are proposing to replace or temper the reference to controlled flame combustion in respective definitions.

1. *Revised definition of industrial furnace.* We are proposing to revise the definition of industrial furnace to refer to thermal treatment rather than to controlled flame combustion. We believe that there are very few additional industrial furnaces (that process nonindigenous waste) that would be regulated under this expanded definition, and it makes no sense to regulate these few furnaces differently than other industrial furnaces processing the same materials. EPA specifically requests comments on the need for the revised industrial furnace definition and resulant impacts on the regulated community.

2. *Plasma arc and infrared devices are incinertors.* We are proposing to revise the definition of incinerator to include explicitly two nonflame combustion devices: plasma arc and infrared incinerators. Although these devices are sometimes considered to be nonflame devices rather than incinerators, we believe that they should be regulated as Subpart O incinerators for two reasons. First, they invariably employ afterburners to combust hydrocarbons driven off by the plasma arc or infrared process. Thus, it can be argued that these units, in fact, meet the current definition of an incinerator. Second, we believe that the Subpart O incinerator standards can be appropriately applied to these devices; the technical requirements of subpart O are appropriate to address the hazards posed by these devices. We also note that applying the Subpart O standards will reduce the burden on both permit writers and applicants. The Subpart X standards are nonprescriptive standards under which permit writers apply permit conditions as appropriate to protect human health and the environment. Thus, under subpart X, permit writers would need to determine on a case-by-case basis whether particular provisions of subpart O are appropriate and whether additional permit conditions would be needed. Using Subpart O strandards removes the ambiguity for both permit writers and applicants over what requirements are necessary.

Today's proposed amendments to the incinerator standards likewise appear suitable for plasma arc and infrared incinerators. We request comment on whether there are other "nonflame" combustion devices for which the Subpart O incinerator standards are applicable (i.e., devices that use an afterburner to combust hydrocarbons generated from hazardous waste by a nonflame process).

We note that we are proposing only to change (or clarify) the regulatory status of these two classes of devices, not to subject them to regulation for the first time. Thus, interim status is not being reopened for these devices. They have

[12] We note that several States control hazardous waste incinerator particulate emissions to levels well below EPA's standard of 0.08 gr/dscf. In addition, several hazardous waste incinerators have been demonstrated to be capable of routinely controlling particulate emissions to levels in the 0.01–0.02 gr/dscf range, or less. Further, as discussed above in the text, the proposed particulate standard for MWCs is 0.015 gr/dscf. Thus, we anticipate that a BDT particulate standard for hazardous waste incinerators would be within that range of 0.01 to 0.02 gr/dscf.

been regulated since 1980 under subpart P (interim status standards for thermal treatment units), subpart X (permit standards for other treatment units), or subpart O (interim status and permit standards for incinerators). We note that the interim status standards of part 265, subpart P, are virtually identical to the interim status standards of part 265, subpart O.

3. *Fluidized bed devices are incinerators.* EPA would also like to clarify that fluidized bed devices are incinerators and are regulated under subpart O. They are not subject to the thermal treatment standards of part 265, subpart P, or requirements established under part 264, subpart X. Fluidized bed incinerators are enclosed devices that are designed to provide contact between a heated inert bed material fluidized with air and the solid waste. Gas is passed upwards through a column of fine particulates at a sufficient velocity to cause the solids/gas mixture to behave like a liquid. The bed is preheated by overfired or underfired auxiliary fuel. It is generally accepted that fluidized beds meet the definition of incinerator, although there may have been some confusion in the past. Although we are clarifying that they do meet the definition of incincerator, we specifically request comment on whether there is sufficient ambiguity to warrant adding fluidized bed devices to the definition of incinerator.

4. *Revised regulatory status of carbon regeneration units.* We are also proposing to revise the regulatory status of carbon regeneration units. Controlled flame carbon regeneration units currently meet the definition of incinerator and have been subject to regulation as such since 1980,[13] while carbon regeneration nonflame units have been treated as exempt reclamation units. We are proposing to regulate both direct flame and nonflame carbon regeneration units as thermal treatment units under the interim status standards of part 265, subpart P, and the permit standards of part 264, subpart X. Our reason for doing this is that we are concerned that emissions from these devices may present a substantial hazard to human health or the environment. We are not proposing to apply the part 264, subpart O, incinerator standards to these units because we are concerned that demonstration of conformance with the DRE standards (and the proposed CO/THC standards) may not be achievable considering the relatively low levels of toxic organic compounds absorbed onto the activated carbon.

The prevailing view appears to be that carbon regeneration units currently are exempt recycling units. We have considered whether or not these units truly are engaged in reclamation, or whether the regeneration of the carbon is just the concluding aspect of the waste treatment process that commenced with the use of activated carbon to absorb waste contaminants, which are now destroyed in the "regeneration" process.[14] Irrespective of whether these units are better classified as waste treatment or recycling units (or whether the units are flame or nonflame devices), we are concerned, as indicated above, that emissions from the regeneration process can pose a serious hazard to public health if not properly controlled. Consequently, nonflame units in existence on the date of promulgation (like flame units) would be subject to part 265, subpart P, and new units would be subject to part 264, subpart X.

We note that we intend for this proposal to also apply to those carbon regeneration units that meet the definition of wastewater treatment units in § 260.10 while they are in active service. These units would not be exempt from regulation when they are being regenerated because they are no longer treating wastewater. Rather, the activated carbon columns themselves are being treated thermally.

B. Regulation of All Thermal Treatment Units Under Subpart O

The Agency has done some preliminary thinking on an alternative approach to regulating combustion devices—the regulation of all thermal treatment devices under virtually identical standards under subpart O. This would avoid a number of problems with the current regulatory approach, including: (1) Ambiguous definitions for boilers and industrial furnaces; (2) incomplete coverage of the incinerator and industrial furnace definitions (e.g., although today's proposal would expand regulatory coverage of industrial furances to include heating by means other than controlled flame combustion, furances other than those that are "integral components of a manufacturing process" (see § 260.10), such as off-site facilities engaged solely in waste management, could be engaged in *bona fide* reclamation and should be classified as an industrial furnace rather than an incinerator); (3) the burden on the regulated community and EPA and State officials to process petitions to classify individual devices as boilers or industrial furnaces rather than incinerators; and (4) the numerous provisions in the proposed boiler and furnace rules that would merely parrot the current and proposed incinerator standards.

Under this alternative approach, all thermal treatment devices would be regulated under the same risk-based standards to control metals and HCl emissions—the standards proposed today for incinerators.[15] Control of organic emissions could also be the same as those CO controls proposed today for incinerators coupled with the existing DRE standards for incinerators. Devices handling wastes with low levels of toxic organic constituents (e.g., smelters, sludge dryers, certain incinerators), however, would not be subject to organic emissions controls. The applicability of standards could, in many cases, be a function of waste properties and composition. It may not be necessary to identify applicability by type of device.

EPA is continuing to consider this alternative. In particular, we are investigating whether the temporary exclusion for the special wastes in RCRA section 3001(b)(3) and the special standards and exemptions proposed for boilers and industrial furnaces can be implemented without definitions for these devices. We specifically request comments on this alternative regulatory approach whereby all thermal treatment units could be regulated under one set of standards under subpart O.

PART THREE: DISCUSSION OF PROPOSED CONTROLS

I. Overview of EPA's Risk Assessment

In developing this regulation, the Agency has used risk assessment to: (1) determine that absent regulatory

[13] There appears to be confusion as to the current regulatory status of direct flame activated carbon regeneration units. Because EPA indicated in the May 19, 1980, preamble that all activated carbon regeneration units were engaged in a form of recycling presently exempt from regulation (45 FR 33094), EPA is proposing in this notice to amend the regulations to control these devices, both direct and indirect fired. Consequently, the "in existence" date for all activated carbon regeneration units would be the date of promulgation of final regulations.

[14] We note that activated carbon units used as air emissions control devices frequently regenerate the carbon in place by steam stripping, condensing the organic contaminants for reuse. The trapped organics in such columns are not hazardous wastes because the gas originally being treated is not a solid waste (it is an uncontained gas), and therefore any condensed organics do not derive from treatment of a listed hazardous waste.

[15] We note that EPA is requesting comment on applying these controls (as well as the proposed CO controls) to boilers and industrial furnaces as well in lieu of those proposed on May 6, 1987. See the Federal Register notice published today entitled, "Burning of Hazardous Waste in Boilers and Industrial Furnaces: Supplement to Proposed Rule."

9489.1988(01)

THERMAL TREATMENT UNITS, SCOPE OF SUBPART X

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAY 18 1988

MEMORANDUM

SUBJECT: Morton Thiokol Thermal Treatment Units

FROM: Sylvia K. Lowrance, Director
Office of Solid Waste (WH-562A)

TO: Robert L. Duprey, Director
Hazardous Waste Management Division
Region VIII

This is in response to your April 13, 1988 memorandum requesting a clarification concerning the scope of Subpart X as related to thermal treatment, and the interaction of Subpart X standards and the land ban restrictions for mixed solvents. I would like to address your concerns in the same order as discussed in your memorandum.

What is the scope of units comprising Subpart X ?

Subpart X covers miscellaneous units not regulated under the standards for specific types of treatment, storage, and disposal units in Part 264, Subparts I through O, or Part 146. Likewise, Subpart X will not supersede or replace any specific restrictions on activities contained in another subpart of the regulations, nor provide a vehicle for escaping from these restrictions.

What is the scope of units comprising Subpart X?

Subpart X covers miscellaneous units not regulated under the standards for specific types of treatment, storage, and disposal units in Part 264, Subparts I through O, or Part 146. Like wise, Subpart X will no supersede or replace any specific restriction on activities contained in another subpart of the regulations, nor provide a vehicle for escaping from these

restrictions.

Specifically, are the units which are operated by placing the liquid wastewater containing reactive wastes into the pit or surface impoundment and then allowing evaporation and percolation of the liquid prior to burning, regulated as thermal treatment units, surface impoundments, or both?

The ten units which are operated by (1) depositing liquid wastewater, containing varying amounts of reactive wastes, directly in unlined pits, (2) allowing the liquid to evaporate/percolate, and then (3) igniting the residue, are surface impoundments. The described pits are specifically included in the definition of surface impoundment in 40 CFR 260.10 (that is, aeration pits). Being such, the units will require permits based an Part 264 Subpart K. 40 CFR 264.220 states that Subpart K applies to facilities that use surface impoundments to treat, store, or dispose of hazardous waste. However, the permit applicant can be required to supply additional information as required in 40 CFR 270.23 (i.e., for miscellaneous units) if the Subpart K standards do not provide adequate protection for human health and the environment. For example, the Regional Administrator may write permit conditions based on the Subpart X standards which would protect the air or surrounding soils during the burning phase of the treatment process.

What land disposal deadlines and restrictions are applicable to the units as defined by the answer to the above question? Must the units meet the November 8, 1988, retrofit deadline or close?

The Agency has concluded that open burning/open detonation (OB/OD) of waste explosives in a Part 265, Subpart Q, or a Part 264, Subpart X, OB/OD unit does not constitute land disposal because it is treatment, not disposal (52 FR 46592). This is true except in cases where the residuals from the OB/OD operation remain a hazardous waste. Therefore, OB/OD activities are not automatically subject to the land disposal restrictions.

As we indicated above, the treatment pits are properly classified as surface impoundments; therefore, all land disposal deadlines and restrictions and the surface impoundment

retrofit deadline remain applicable. Furthermore; a unit is an OB/OD unit under Parts 264 and 265 when it is not a surface, impoundment and when it open burns/detonates waste explosives. As mentioned in 265.382, non-military waste explosives can be open burned/detonated only when they have the potential to detonate. According to the information we have on Morton Thiokol's treatment pits or impoundments, wastewater that does not have the potential to detonate is placed in a pit and is treated by dewatering and subsequent burning.

Does the burning of solvents which are contaminated with reactive material constitute a violation of 40 CFR 265,382 hazardous waste open burning prohibition? Does the solvent mixed waste meet the Subpart X burning requirements?

The open burning of solvents is strictly prohibited. Only waste explosives that have the potential to detonate, and bulk military propellants which cannot be safely disposed of through other modes of treatment, can be open burned in a Part 264 Subpart X, or Part 265, Subpart Q, unit. (See 40 CFR 265.382) If the waste solvent is a waste explosive that has the potential to detonate, then it can be open burned provided that the unit fits the appropriate criteria. The descriptive information on unit #11 is not definitive but we suspect that "trough" referred to in your memorandum may be a tank, and therefore, also does not qualify as a 264, Subpart X, or Part 265, Subpart Q unit.

More information is needed for us to make a final determination on the potential to detonate (e.g., exact concentration of explosive or ratio of materials is not known nor is its fulfillment of the definition of "detonate" in 265.382 fully known). However, we do not think the open burning of the 1,1,1-trichloroethane or any other solvent will prove to be proper when this information is provided.

What land ban requirements are applicable to the solvent wastes? Can the solvents be opened burned and do the land ban requirements apply to the solvents?

Because disposal of the solvents is not likely to qualify as OB/OD in a Subpart X or Subpart Q unit, all of the land disposal restriction requirements, including those at 40 CFR 268.4, would appear to be applicable to the management of

solvents in the situation you outlined. In such event, the solvents cannot be open burned.

If you have a question regarding these clarifications or would like to discuss the issues in more detail, please contact Chester Oszman (382-4499).

cc: Hazardous Waste Branch Chiefs, Regions I-X
Lisa Reed, Region VIII
Fred Chanania, OGC
Kent Anderson, OSW
Chester Oszman, OSW

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Parker E. Brugge
Patton Boggs, L.L.P.
2550 M Street, N. W.
Washington, D.C. 20037-1350

Dear Mr. Brugge:

This letter is in response to your April 7, 1998, letter seeking clarification on the distinction between thermal desorbers and incinerators. Under the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 260.10), thermal treatment units that are enclosed devices using controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart 0. Thermal treatment units that do not use controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

EPA regulations do not define "thermal desorber", but the term generally applies to a unit that treats waste thermally to extract the contaminants from the matrix. A thermal desorber utilizing controlled flame combustion (e.g., equipped with a directly fired desorption chamber and/or a fired afterburner to destroy organics) would meet the regulatory definition of an incinerator. On the other hand, a thermal desorber that did not use controlled flame combustion (e.g., equipped with an indirectly heated desorption chamber and the desorbed organics were not "controlled"/destroyed with an afterburner) would be classified as a "miscellaneous unit".

With regard to the September 1993 Presumptive Remedy guidance entitled: `Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils" (Directive Number 9355.0-48FS) that you mentioned, EPA identified thermal &sorption and incineration as the second and third preferred technologies, respectively. The intent of the guidance is that units that can be generally described as thermal desorbers, whether or not they are also incinerators, are second in the preference list. However, if a thermal desorber that meets the RCRA definition of incinerator is used to treat hazardous waste at a CERCLA site, the unit must meet RCRA's incinerator standards, EPA developed the preferential order set out in this guidance based on historical patterns of remedy selection and EPA's

scientific and engineering evaluation of performance data on technology implementation. There was no intent implied or stated in the Presumptive Remedy guidance that the preferential order was based on the temperature of operation; the guidance does not limit the thermal desorbers technologies to those that are low-temperature thermal desorbers.

We appreciate that as technologies evolve, the distinctions between units often become blurred, and, in the case of thermal desorbers, may fail within two separate classifications depending on the design of the unit. Classification of a "thermal treatment" unit, however, is defined by 40 CFR 260.10.

Both the RCRA regulatory framework and the CERCLA remedy selection process provide adequate flexibility to ensure that the unit is operated in a protective manner and that there is adequate and informed public participation. If you have any further questions, please contact either Andrew O'Palko, Office of Solid Waste, at (703) 308-8646 or Robin Anderson, Office of Emergency and Remedial Response, at (703) 603-8747.

Sincerely,

Elizabeth Cotsworth
Acting Director
Office of Solid Waste

Sincerely,

Stephen D. Luftig
Director
Office of Emergency and
Remedial Response

cc: Andrew O'Palko, OSW
Bob Holloway, OSW
Robin Anderson, OERR
Karen Kraus, OGC
Superfund Regional Response Managers
RCRA Senior Policy Advisors

PATTON BOGGS, L.L.P.

2550 M STREET. N.W.
WASHINGTON. D.C. 20037-1350
(202) 457-6000 (202) 457-5225

April 2, 1998

Ms. Elizabeth A. Cotsworth
Acting Director
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W. (5301W)
Washington, D.C. 20460

Dear Ms. Cotsworth:

I am writing to seek clarification on the distinction between thermal desorbers and incinerators.

It is my understanding that thermal treatment units which are enclosed devices using controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart O. It is also my understanding that thermal treatment units which do not use controlled flame combustion, and that are not industrial furnaces, are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

Thus, a thermal desorber is subject to regulation as an incinerator if it is equipped with a fired afterburner, or if the desorption chamber is directly fired. However, I would assume that, although such a device is subject to regulation under Subpart O, it nevertheless remains a "thermal desorber." The fact that it must meet the standards set forth in Subpart O for incinerators does not transform it somehow into an incinerator for CERCLA purposes.

For example, EPA issued guidance in September 1993 explaining that at a Superfund site which has soil contaminated with volatile organic compounds, the range of remedial technologies set forth in a Record of Decision may be soil-vapor extraction ("SVE"), low-temperature thermal desorption ("LTTD"), and incineration. The preferred order is SVE, LTTD, and, as a last resort, incineration. A thermal desorber with a fired afterburner, or one whose desorption chamber is directly fired, must fall within the "thermal desorption" family of technologies, even though it would be subject to regulation under Subpart O as an incinerator.

To hold otherwise would disqualify the large majority of LTTD units, which are directly fired and use afterburners for air pollution control. This result would be contrary to EPA's CERCLA guidance and to the Administrator's emphasis on reducing incineration which involves the high-temperature burning of contaminated soil.

There appears to be some confusion on this issue, for which we would appreciate your help in clarifying. Please call me if you have any questions or if you would like to discuss this issue further.

Sincerely,

Parker E. Brugge

cc: Bob Holloway

EPA-452/F-03-022

Air Pollution Control Technology Fact Sheet

Name of Technology: Thermal Incinerator

This type of incinerator is also referred to as a direct flame incinerator, thermal oxidizer, or afterburner. However, the term afterburner is generally appropriate only to describe a thermal oxidizer used to control gases coming from a process where combustion is incomplete.

Type of Technology: Destruction by thermal oxidation

Applicable Pollutants: Primarily volatile organic compounds (VOC). Some particulate matter (PM), commonly composed as soot (particles formed as a result of incomplete combustion of hydrocarbons (HC), coke, or carbon residue) will also be destroyed in various degrees.

Achievable Emission Limits/Reductions:

VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing) (EPA, 1992). Typical thermal incinerator design efficiencies range from 98 to 99.99% and above, depending on system requirements and characteristics of the contaminated stream (EPA, 1992; EPA, 1996a). The typical design conditions needed to meet 98% or greater control or a 20 parts per million by volume (ppmv) compound exit concentration are: 870°C (1600°F) combustion temperature, 0.75 second residence time, and proper mixing. For halogenated VOC streams, 1100°C (2000°F) combustion temperature, 1.0 second residence time, and use of an acid gas scrubber on the outlet is recommended (EPA, 1992).

For vent streams with VOC concentration below approximately 2000 ppmv, reaction rates decrease, maximum VOC destruction efficiency decreases, and an incinerator outlet VOC concentration of 20 ppmv, or lower may be achieved (EPA, 1992).

Controlled emissions and/or efficiency test data for PM in incinerators are not generally available in the literature. Emission factors for PM in phthalic anhydride processes with incinerators are available, however. The PM control efficiencies for these processes were found to vary from 79 to 96% (EPA, 1998). In EPA's 1990 National Inventory, incinerators used as control devices for PM were reported as achieving 25 to 99% control efficiency of particulate matter 10 microns or less in aerodynamic diameter (PM_{10}) at point source facilities (EPA, 1998). Table 1 presents a breakdown of the PM_{10} control efficiency ranges by industry for recuperative incinerators (EPA, 1996b). The VOC control efficiency reported for these devices ranged from 0 to 99.9%. These ranges of control efficiencies are large because they include facilities that do not have VOC emissions and control only PM, as well as facilities which have low PM emissions and are primarily concerned with controlling VOC (EPA, 1998).

Table 1. Thermal Incinerator PM_{10} Destruction Efficiencies by Industry (EPA, 1996b)

Industry/Types of Sources	PM_{10} Control Efficiency (%)
Petroleum and Coal Products asphalt roofing processes (blowing, felt saturation); mineral calcining; petroleum refinery processes (asphalt blowing, catalytic cracking, coke calcining, sludge converter); sulfur manufacturing	25 - 99.9
Chemical and Allied Products carbon black manufacturing (mfg); charcoal mfg; liquid waste disposal; miscellaneous chemical mfg processes; pesticide mfg; phthalic anhydride mfg (xylene oxidation); plastics/synthetic organic fiber mfg; solid waste incineration (industrial)	50 - 99.9
Primary Metals Industries by-product coke processes (coal unloading, oven charging and pushing, quenching); gray iron cupola and other miscellaneous processes; secondary aluminum processes (burning/drying, smelting furnace); secondary copper processes (scrap drying, scrap cupola, and miscellaneous processes); steel foundry miscellaneous processes; surface coating oven	70 - 99.9
Electronic and Other Electric Equipment chemical mfg miscellaneous processes; electrical equipment bake furnace; fixed roof tank; mineral production miscellaneous processes; secondary aluminum roll/draw extruding; solid waste incineration (industrial)	70 - 99.9
Electric, Gas, and Sanitary Services internal combustion engines; solid waste incineration (industrial, commercial/ institutional)	90 - 98
Stone, Clay, and Glass Products barium processing kiln; coal cleaning thermal dryer; fabricated plastics machinery; wool fiberglass mfg	50 - 95
Food and Kindred Products charcoal processing, miscellaneous; corn processing, miscellaneous, fugitive processing, miscellaneous; soybean processing, miscellaneous	70 - 98
Mining asphalt concrete rotary dryer; organic chemical air oxidation units, sulfur production	70 - 99.6
National Security and International Affairs solid waste incineration (commercial/institutional and municipal)	70
Textile Mill Products plastics/synthetic organic fiber (miscellaneous processes)	88 - 95
Industrial Machinery and Equipment secondary aluminum processes (burning/drying, smelt furnace)	88 -98
Lumber and Wood Products solid waste incineration (industrial)	70
Transportation Equipment solid waste incineration (industrial)	70 - 95

Applicable Source Type: Point

Typical Industrial Applications:

Thermal incinerators can be used to reduce emissions from almost all VOC sources, including reactor vents, distillation vents, solvent operations, and operations performed in ovens, dryers, and kilns. They can handle minor fluctuations in flow, however, excess fluctuations require the use of a flare (EPA, 1992). Their fuel consumption is high, so thermal units are best suited for smaller process applications with moderate-to-high VOC loadings.

Incinerators are used to control VOC from a wide variety of industrial processes, including, but not limited to the following (EPA, 1992):

- Storing and loading/unloading of petroleum products and other volatile organic liquids;
- Vessel cleaning (rail tank cars and tank trucks, barges);
- Process vents in the synthetic organic chemical manufacturing industry (SOCMI);
- Paint manufacturing;
- Rubber products and polymer manufacturing;
- Plywood manufacturing;
- Surface coating operations:
  Appliances, magnetic wire, automobiles, cans, metal coils, paper, film and foil, pressure sensitive tapes and labels, magnetic tape, fabric coating and printing, metal furniture, wood furniture, flatwood paneling, aircraft, miscellaneous metal products;
- Flexible vinyl and urethane coating;
- Graphic arts industry; and
- Hazardous waste treatment storage, and disposal facilities (TSDFs).

Emission Stream Characteristics:

a. **Air Flow:** Typical gas flow rates for thermal incinerators are 0.24 to 24 standard cubic meters per second (sm^3/sec) (500 to 50,000 standard cubic feet per minute (scfm)) (EPA, 1996a).

b. **Temperature:** Most incinerators operate at higher temperatures than the ignition temperature, which is a minimum temperature. Thermal destruction of most organic compounds occurs between 590°C and 650°C (1100°F and 1200°F). Most hazardous waste incinerators are operated at 980°C to 1200°C (1800°F to 2200°F) to ensure nearly complete destruction of the organics in the waste (AWMA, 1992).

a. **Pollutant Loading:** Thermal incinerators can be used over a fairly wide range of organic vapor concentrations. For safety considerations, the concentration of the organics in the waste gas must be substantially below the lower flammable level (lower explosive limit, or LEL) of the specific compound being controlled. As a rule, a safety factor of four (i.e., 25% of the LEL) is used (EPA, 1991, AWMA, 1992). The waste gas may be diluted with ambient air, if necessary, to lower the concentration. Considering economic factors, thermal incinerators perform best at inlet concentrations of around 1500 to 3000 ppmv, because the heat of combustion of hydrocarbon gases is sufficient to sustain the high temperatures required without addition of expensive auxiliary fuel (EPA, 1995).

d. **Other Considerations:** Incinerators are not generally recommended for controlling gases containing halogen- or sulfur-containing compounds, because of the formation of hydrogen chloride, hydrogen fluoride gas, sulfur dioxide, and other highly corrosive acid gases. It may be necessary to install a post-oxidation acid gas treatment system in such cases, depending on the outlet concentration. This would likely make incineration an uneconomical option. (EPA, 1996a). Thermal

incinerators are also not generally cost-effective for low-concentration, high-flow organic vapor streams (EPA, 1995).

Emission Stream Pretreatment Requirements:

Typically, no pretreatment is required, however, in some cases, a concentrator (e.g., carbon or zeolite adsorption) may be used to reduce the total gas volume to be treated by the more expensive incinerator.

Cost Information:

The following are cost ranges (expressed in 2002 dollars) for packaged thermal incinerators of conventional design under typical operating conditions, developed using EPA cost-estimating spreadsheets (EPA, 1996a) and referenced to the volumetric flow rate of the waste stream treated. The costs do not include costs for a post-oxidation acid gas treatment system. Costs can be substantially higher than in the ranges shown when used for low to moderate VOC concentration streams (less than around 1000 to 1500 ppmv). As a rule, smaller units controlling a low concentration waste stream will be much more expensive (per unit volumetric flow rate) than a large unit cleaning a high pollutant load flow. Operating and Maintenance (O & M) Costs, Annualized Cost, and Cost Effectiveness are dominated by the cost of supplemental fuel required.

a. **Capital Cost:** \$53,000 to \$190,000 per sm^3/sec (\$25 to \$90 per scfm)

b. **O & M Cost:** \$11,000 to \$160,000 per sm^3/sec (\$5 to \$75 per scfm), annually

c. **Annualized Cost:** \$17,000 to \$208,000 per sm^3/sec (\$8 to \$98 per scfm), annually

d. **Cost Effectiveness:** \$440 to \$3,600 per metric ton (\$400 to \$3,300 per short ton), annualized cost per ton per year of pollutant controlled

Theory of Operation:

Incineration, or thermal oxidation is the process of oxidizing combustible materials by raising the temperature of the material above its auto-ignition point in the presence of oxygen, and maintaining it at high temperature for sufficient time to complete combustion to carbon dioxide and water. Time, temperature, turbulence (for mixing), and the availability of oxygen all affect the rate and efficiency of the combustion process. These factors provide the basic design parameters for VOC oxidation systems (ICAC, 1999).

A straight thermal incinerator is comprised of a combustion chamber and does not include any heat recovery of exhaust air by a heat exchanger (this type of incinerator is referred to as a recuperative incinerator).

The heart of the thermal incinerator is a nozzle-stabilized flame maintained by a combination of auxiliary fuel, waste gas compounds, and supplemental air added when necessary. Upon passing through the flame, the waste gas is heated from its preheated inlet temperature to its ignition temperature. The ignition temperature varies for different compounds and is usually determined empirically. It is the temperature at which the combustion reaction rate exceeds the rate of heat losses, thereby raising the temperature of the gases to some higher value. Thus, any organic/air mixture will ignite if its temperature is raised to a sufficiently high level (EPA, 1996a).

The required level of VOC control of the waste gas that must be achieved within the time that it spends in the thermal combustion chamber dictates the reactor temperature. The shorter the residence time, the higher the reactor temperature must be. The nominal residence time of the reacting waste gas in the combustion chamber is defined as the combustion chamber volume divided by the volumetric flow rate of the gas. Most thermal units are designed to provide no more than 1 second of residence time to the waste gas with typical temperatures of 650 to 1100°C (1200 to 2000°F). Once the unit is designed and built, the residence time is

not easily changed, so that the required reaction temperature becomes a function of the particular gaseous species and the desired level of control (EPA, 1996a).

Studies based on actual field test data, show that commercial incinerators should generally be run at 870°C (1600°F) with a nominal residence time of 0.75 seconds to ensure 98% destruction of non-halogenated organics (EPA, 1992).

Advantages:

Incinerators are one of the most positive and proven methods for destroying VOC, with efficiencies up to 99.9999% possible. Thermal incinerators are often the best choice when high efficiencies are needed and the waste gas is above 20% of the LEL.

Disadvantages:

Thermal incinerator operating costs are relatively high due to supplemental fuel costs.

Thermal incinerators are not well suited to streams with highly variable flow because of the reduced residence time and poor mixing during increased flow conditions which decreases the completeness of combustion. This causes the combustion chamber temperature to fall, thus decreasing the destruction efficiency (EPA, 1991).

Incinerators, in general, are not recommended for controlling gases containing halogen- or sulfur-containing compounds because of the formation of highly corrosive acid gases. It may be necessary to install a post-oxidation acid gas treatment system in such cases, depending on the outlet concentration (EPA, 1996a). Thermal incinerators are also not generally cost-effective for low-concentration, high-flow organic vapor streams (EPA, 1995).

Other Considerations:

Thermal incinerators are not usually as economical, on an annualized basis, as recuperative or regenerative incinerators because they do not recover waste heat energy from the exhaust gases. This heat can be used to preheat incoming air, thus reducing the amount of supplemental fuel required. If there is additional heat energy available, it can be used for other process heating needs.

References:

AWMA, 1992. Air & Waste Management Association, Air Pollution Engineering Manual. Van Nostrand Reinhold, New York.

EPA, 1991. U.S. EPA, Office of Research and Development, "Control Technologies for Hazardous Air Pollutants," EPA/625/6-91/014, Washington, D.C., June.

EPA, 1992. U.S. EPA, Office of Air Quality Planning and Standards, "Control Techniques for Volatile Organic Emissions from Stationary Sources," EPA-453/R-92-018, Research Triangle Park, NC., December.

EPA, 1995. U.S. EPA, Office of Air Quality Planning and Standards, "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams," EPA-456/R-95-003, Research Triangle Park, NC., May.

EPA, 1996a. U.S. EPA, Office of Air Quality Planning and Standards, "OAQPS Control Cost Manual," Fifth Edition, EPA 453/B-96-001, Research Triangle Park, NC. February.

EPA, 1996b. U.S. EPA, "1990 National Inventory," Research Triangle Park, NC, January.

EPA, 1998. U.S. EPA, Office of Air Quality Planning and Standards, "Stationary Source Control Techniques Document for Fine Particulate Matter," EPA-452/R-97-001, Research Triangle Park, NC., October.

ICAC, 1999. Institute of Clean Air Companies internet web page www.icac.com, Control Technology Information - Thermal Oxidation, page accessed March 1999.

9498.1994(08)

CLARIFICATION REGARDING SINGLE EMISSION POINT, MULTI-DEVICE COMBUSTION FACILITIES

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

July 29, 1994

MEMORANDUM

SUBJECT: Clarification Regarding Single Emission Point, Multi-Device Combustion Facilities

FROM: Michael H. Shapiro, Director
Office of Solid Waste

TO: Allyn M. Davis, Director Hazardous Waste Management Division, Region VI

Walter L. Sutton, Jr., Acting Regional Counsel
Office of Regional Counsel, Region VI

This memorandum is in response to your July 8, 1994, memorandum requesting clarification of a prior headquarters opinion regarding the Giant Cement Company in Harleyville, South Carolina. I understand that the recent court ruling on Marine Shale Processors has raised some questions about EPA's interpretation of the regulatory status of multi-device combustion facilities. In particular, we think that our August 11, 1992 memorandum regarding Giant Cement and Region IV's subsequent letter of November 24, 1993 was misapplied. I thus agree with Region VI that it is important to clarify this issue so that consistent determinations can be made nationwide.

This memorandum will clarify how the RCRA regulations apply to combustion devices (incinerators, industrial furnaces, and boilers) at facilities in which more than one of these devices are connected and in which the emissions from the connected devices emanate from a single emissions point. I believe the confusion arose because there are two basic issues that are encountered when applying the regulations to units in series: 1) what emission controls and

operating conditions are technically appropriate and will be fully protective of human health and the environment; and 2) what legal categories do the units fall into, for the purpose of determining regulatory coverage, eligibility for interim status, need for permit modifications, etc. The Giant memo addressed only the first issue, but appears to have been misinterpreted to apply to the second issue also. Following interpretation of the two issues.

Emission Controls

Giant Cement operated a hazardous waste-fired cement kiln and a number of "resource recovery kilns" burning contaminated soil. Both the off-gas and the treated-solids from the resource recovery kilns were fed into the cement kiln. The resource recovery kilns were interim status incinerators.

The Giant memo referenced above addressed only the question of what types of operational and emissions controls are appropriate to impose on connected devices with a single emissions point, by stating: "For systems of two or more hazardous waste treatment units in series, our general guideline is that a case-by-case determination of how the overall system is classified and what standards and permit conditions are applied should be based on the dominant design, operating, feed, and emissions characteristics of the system, and the most specific standards applicable to that type of system." We still believe this type of flexible approach is important because of the difficulty, from an engineering standpoint, of applying two sets of potentially conflicting emission standards (e.g., the Part 264 Subpart O incinerator standards and the Part 266 Subpart H boiler and industrial furnace (BIF) standards) to a single emissions point on a series of devices which are connected.

In performing a technical evaluation of what standards should be applied to a group of units in series, it will usually be necessary to look at the reasoning behind the regulatory requirements, as expressed in preambles and guidance documents, and not simply at the regulatory requirements. Based on this type of evaluation, if two sets of emissions standards fit equally well from a technical standpoint, preference should be given to the more stringent standards. If not, the standards which are most-appropriate technically, considering their regulatory rationale, should be applied. In addition, the permit writer should consider whether additional conditions beyond the regulations are

necessary to tailor the permit to the specific system and site in order to protect human health and the environment (through use of the RCRA 3005(c)(3) omnibus authority).

It should also be noted that there may be cases, such as where two or more combustion devices operate in parallel and share only a common stack, in which the determination of what standards to apply is straightforward (i.e., unit by unit). The principal remaining issue in this situation is how to do the testing to determine whether each unit is meeting the standards.

Permitting/Interim status Determination

The above determination of the most technically appropriate and protective emissions controls to apply in the permit for interconnected devices must be distinguished from the classification of the devices for purposes of determining interim status eligibility and other issues. Because Giant had already attained interim status separately for its "resource recovery kilns" as incinerators and for its cement kiln as an industrial furnace, the August 1992 memorandum did not address nor need to address the classification of these devices for such purposes.

For the same reason, Region IV's November 24, 1993 letter to Giant Cement indicating that the resource recovery kilns would now be subject to hazardous waste incinerator emission standards because the combusted contaminated soil from those units was being disposed and not put into the cement kiln, dealt only with the issue of what emission standards would apply to these kilns. These earlier documents addressed the only question asked, which is what emission standards should apply.

In recognition of the practical difficulties of applying more than one set of standards to a single emission point, these documents discussed the criteria to be used in determining what emission standards should apply to that point. Under the principles discussed in these documents, EPA may determine, for example, that the emissions from a process train involving an incinerator and a cement kiln are most appropriately regulated under the emissions standards applicable to cement kilns. This does not mean that the incinerator "becomes" a cement kiln; it simply means that the common emission point should be regulated under the cement kiln standards.

These documents did not intend to suggest that the individual units in a process train lose their unit identities. The separate identities of the individual units in a process train is relevant in the context of facilities seeking to obtain interim status, among other situations. Under EPA regulations, a facility that is "in existence" on the effective date of a statutory or regulatory change that subjects it to the requirement to obtain a RCRA permit may obtain interim status by submitting Part A of its permit application and complying with statutory notification requirements. 40 CFR 270.70(a). A unit that is already subject to the permit requirement cannot obtain interim status upon the promulgation of regulations bringing a different type of unit into the RCRA system. See 56 FR at 7142 (February 21, 1991) (aggregate kiln burning hazardous waste for destruction and thereby subject to the rules for incinerators is not newly eligible for interim status when BIF rules are promulgated).

In reviewing a Part A application form filed by a facility seeking interim status following the regulation of a new type of unit, EPA evaluates whether the unit (or units) identified on the form were of the newly regulated type. In performing this evaluation, EPA-would compare the unit with the unit-definitions set forth in its regulations, irrespective of whether the unit was self-contained or part of a process train. In particular, if the unit and other units shared a common emission point, the regulatory emission standards determined to be most technically appropriate for that point would be irrelevant to the identity of the unit in question.

The pertinent definitions for combustion devices are the definitions of "boiler", "industrial furnace", and "incinerator" in 260.10. The definition of boiler is based on unit design. Industrial furnaces are an enumerated list of devices that are parts of manufacturing processes and incinerators are devices which are not boilers or industrial furnaces. The list of industrial furnaces is not written in terms of device systems; it describes particular devices: "cement kilns", "aggregate kilns", "halogen acid furnaces", etc. Consequently, a device would normally need to fit one of these descriptions to be an industrial furnace.

The Agency's interpretation is that the list of industrial furnaces applies on a device-by-device basis whenever the devices are combusting separate (i.e., not from another device in the series) hazardous wastes. The only exception would be where the

Agency has indicated unequivocally (normally in the context of a notice-and-comment rulemaking) that the definition of that industrial furnace type applies to multiple devices. The only device for which the Agency has done so are cement kiln precalciners, which EPA agrees are invariably operated as part of one cement-manufacturing operation, even if the precalciner is separately fired with hazardous waste (see footnote 1). See, e.g., 54 FR at 43761 (Oct. 26, 1989). The Agency did not consider the effect of emissions from other connected hazardous waste units when it promulgated the BIF rule.

The interpretation that the industrial furnace definition is to be read to apply to each combustion device burning separate hazardous waste is consistent with the literal language of the industrial furnace definition. It is also consistent with statutory provisions requiring that hazardous waste combustion can only be performed pursuant to stringent regulatory control, RCRA sections 3004(o)(1)(B) and 3004(q), and that hazardous waste be properly managed in the first instance. RCRA section 1003(a)(5). These goals would be circumvented if hazardous waste-fired units were simply considered to be part of the industrial furnace. Before the BIF rules became effective, for example, this would mean that the additional unit -- an incinerator -- could burn hazardous waste without any regulatory control.

This interpretation covers the case of two hazardous waste fired devices. If the additional device is not hazardous waste fired, then it could be considered to be part of the industrial furnace. The Agency has in fact indicated in explanatory preambles and other interpretive documents that industrial furnaces can include certain integrated components that pretreat materials or assist in air pollution control. See, e.g., 56 FR at 42598 (August 27, 1991). So long as these devices are not burning separate hazardous wastes, they do not raise the core RCRA concerns discussed above, and can accordingly be regulated as part of the industrial furnace (see footnote 2).

Example

To illustrate the application of the above principles to combustion units in series, consider the following example. The owner/operator of an interim status cement kiln chooses to add an afterburner to help achieve control of PIC emissions (see 57 FR at

38561 (Aug. 27, 1991) where EPA suggested this course as a means of reducing organic emissions) and further chooses to fire the afterburner with hazardous waste. The hazardous-waste fired afterburner is not a cement kiln, but rather is a separate device: an incinerator (see footnote 3). It is not on the list of industrial furnaces, and it is engaged in the type of activity -- hazardous waste combustion -- for which regulatory controls are mandated. Thus, the afterburner is ineligible for interim status as part of the cement kiln. The facility would have to apply for a change during interim status under 270.72(a)(3) for addition of a process and receive Director approval based on meeting the criteria in that section.

However, in the same example, if the cement kiln were to add an afterburner which is not hazardous waste-fired, the Agency would not view this action as adding an incinerator. By not separately combusting hazardous waste, the hypothetical afterburner is not separately engaged in hazardous waste treatment. Rather, it is simply treating emissions from a hazardous waste treatment device, and so is considered part of that device. In such a case no regulatory approval under the change during interim status provisions is needed to add the device, and the afterburner becomes part of the interim status cement kiln.

I hope this has clarified the issue of how to address interconnected combustion devices. If you have further questions, feel free to call me, or have your staff contact Sonya Sasseville at (703) 308-8648.

cc: Matt Straus, Fred Chanania, Dev Barnes, Matt Hale, Frank McAlister, Larry Starfield, Steve Silverman, Terry Sykes, Laurie King, Waste Combustion Permit Writers' Workgroup, Subpart X Permit Writers' Workgroup

1 While the Agency may have identified other devices which do not separately fire hazardous waste as part of an industrial furnace, precalciners are the only hazardous waste-fired devices for which such an interpretation has been made.

2 This is not intended to imply that the presence of an afterburner not separately fired with hazardous waste on a non-controlled flame device never affects the regulatory classification of that device. In the case of plasma arc and infrared units, the Agency has classified

those devices as incinerators when they have afterburners (considering the plasma arc or infrared device plus the afterburner to be one unit) and as Subpart X devices when they do not. (See 56 FR 7204, 57 FR 38562, and incinerator definition at 40 CFR 260.10.) It is expected that there will be other situations in the future where the Agency will be developing separate definitions for units in series. This will be done through rulemaking, as appropriate.

3 EPA officials have in fact given this advice to cement kilns contemplating adding afterburners to assist in meeting emission controls for products of incomplete combustion.